

BAG FOR MOISTURE REMOVAL

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention relates to bags for moisture removal, and
5 more particularly to a bag for moisture removal comprising a box with a
box cover containing exsiccator and a bag for enclosing the exsiccator
box. The box and the box cover each include at least one diversion
groove, which combine to form a water channel as the box and the box
cover are buckled together. The box cover is provided with many fine
10 holes, and the bag is provided with a plurality of through holes on one
side thereof in a corresponding area, which through holes are sealed from
outside by an adhesive paper sheet when the bag is not in use. The lower
portion of the bag forms a liquid container. To use the bag for moisture
removal, the adhesive paper sheet is removed firstly and the bag is
15 hanged in a room. The exsiccator absorbs the moisture in the air and
produces water drops, which flow through diversion grooves to be
collected in the liquid container, thereby achieving the effect of keeping
the room from being over moist. The bag for moisture removal is further
advantageous in occupying little space.

20 2. Description of the Prior Art

Exsiccator of various types is widely utilized to maintain the aridity
of objects so that they are not easy to deteriorate and that they would
weigh less for shipment. The contents of objects being applied a bag for
moisture removal or exsiccator of the prior art can be medicine, food,
25 optical instruments, precision electronic instruments, magnetic disks,
cameras, furniture, fabrics, books, paintings, toys, etc. Especially when

being sea-shipped in a cargo container, a large variation in temperature in a cargo container would often cause an invasion of a substantial amount of moisture, resulting in condensed water drops spread over the shipped objects. To prevent the objects from further erosion, it is necessary to
5 provide an effective mechanism of moisture removal that occupies the least possible space in the container.

SUMMARY OF THE INVENTION

Accordingly, the primary objective of the present invention is to provide a bag for moisture removal capable of effectively absorbing
10 moisture within a limited space.

A further objective of the present invention is to protect objects in a cargo container from damage due to moisture and at the same time to occupy the least possible space in the container.

To achieve above object, the present invention provide a bag for
15 moisture removal comprising: a box for containing exsiccator being provided with at least one first diversion groove and a box cover, the box cover having a plurality of fine holes spread over a surface thereof and having a second diversion groove corresponding to the first diversion groove; and a bag for enclosing the combined box and box cover, the bag
20 having a plurality of through holes on one surface thereof corresponding to the fine holes on the enclosed box cover, an adhesive paper sheet sealing the through holes of the bag, the bag being melt-sealed at a top end and partially melt-sealed in a middle section to form a binding section around which the diversion grooves go through, a lower portion of the bag
25 forming a liquid container for collecting water drops produced in the box and flowing through the diversion grooves; and the adhesive paper sheet being removed firstly and the bag being hanged in a room, the exsiccator

absorbing moisture in the air and producing water drops, which flow through diversion grooves and are collected in the liquid container, thereby achieving the effect of keeping the room dry.

Moreover the present invention provides a bag for moisture
5 removal comprising a box for containing exsiccator being provided with at least one first diversion groove and a box cover, the box cover having a plurality of fine holes spread over a surface thereof and having a second diversion groove corresponding to the first diversion groove; a bag for enclosing the combined box and box cover, the bag having a plurality of
10 through holes on one surface thereof corresponding to the fine holes on the enclosed box cover, an adhesive paper sheet sealing the through holes of the bag, the bag being melt-sealed at a top end and partially melt-sealed in a middle section to form a binding section around which the diversion grooves go through, a lower portion of the bag forming a liquid
15 container for collecting water drops produced in the box and flowing through the diversion grooves; and an outer cover provided with an open bottom end and a top connecting portion for connecting an upper end of the bag for moisture removal, a window being formed on one side of the outer cover corresponding to the fine holes on the box cover, and the
20 outer cover being expanded and standing uprightly, the water drops formed by absorption of moisture flowing into the liquid container of the bag, the liquid container being supported by a stand of the outer cover so that the bag for moisture removal may keep in a standing configuration.

Moreover, the present invention provides a bag for moisture
25 removal comprising an exsiccator pack; and a bag enclosing the exsiccator bag being provided with a plurality of through holes and having a lower portion that forms a liquid container; the bag for moisture removal providing a fast effect of moisture removal for spaces of higher moisture.

BRIEF DESCRIPTION OF DRAWINGS

Fig.1 is an exploded perspective view of the first preferred embodiment according to the present invention.

Fig.2 is a perspective view of the first preferred embodiment
5 according to the present invention.

Fig.3 illustrates the use of the first preferred embodiment according to the present invention in a hanging configuration.

Fig.4 is a lateral view of the first preferred embodiment according to the present invention in a hanging configuration.

10 Fig.5 is an exploded perspective view of the second preferred embodiment according to the present invention.

Fig.6 illustrates the use of the second preferred embodiment according to the present invention in a hanging configuration.

15 Fig.7 is a lateral view of the second preferred embodiment according to the present invention in a hanging configuration.

Fig.8 is an exploded perspective view of the third preferred embodiment according to the present invention.

Fig.9 illustrates the use of the third preferred embodiment according to the present invention.

20 Fig.10 illustrates the present invention being folded and packed.

Fig.11 is a perspective view of the packing box of the present invention.

Fig.12 illustrates a bag for moisture removal according to the present invention being used together with the packing box.

25 Fig.13 is a perspective view of the fourth preferred embodiment according to the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

The various objects and advantages of the present invention will be more readily understood from the following detailed description of preferred embodiments, when read in conjunction with the appended drawings.

5 Referring Fig.1 to Fig.4, the first preferred embodiment of the present invention as bag for moisture removal 1 an comprises a box 11 having a box cover 12 and a box cover 12 retaining the box 11. The box 11 is provided with a receptacle 110 for housing exsiccator 14. The outer lateral sides of the box 11 are each provided with a roofed edge 111, and
10 one end of the box 11 is provided with at least one diversion groove 112. The bottom portion of the box 11 is substantially trapezoid-shaped, with two slopes 113 for being accommodated to the grooves on the wiggled plates of a cargo container. The slopes 113 within the box 11 are further provided with a plurality of reinforcing strips 114. The box cover 12, which
15 is for being coupled with the box 11, has a large number of fine holes 120 on its surface and a plurality of inlaying granular objects 121 distributed along two lateral faces for retaining the roofed edges 111 of the box 11. At least one diversion groove 122 is formed on one side of the bottom surface of the box cover 12, which corresponds to the diversion groove
20 112 of the box 11. The bag 13 encloses the combined box 11 and box cover 12 and has a plurality of box cover through holes 130 that correspond to the fine holes 120 on the box cover 12. An adhesive paper sheet 131 seals the through holes 130 on the outer surface of the bag 13. The bottom end of the bag 13 is fully melt-sealed, whereas the middle
25 portion of the bag 13 is partially melt-sealed to form a central section 133, allowing the diversion groove 112 and the diversion groove 122 respectively of the box 11 and the box cover 12 to go through two unsealed sides about the binding points 133. The lower half of the bag 13

forms a liquid container 132, on which a plurality of binding points 133 are formed to prevent over-expansion of the liquid container 132 that would bulge to occupy cargo storage space.

Therefore, exsiccator 14 is firstly placed in the receptacle 110
5 within the box 11, and then the box cover 12 is buckled with the box 11. Next, the bag 13 is used to enclose the combined box 11 and box cover 12, having the side provided with the through holes 130 facing the fine holes 120 on the box cover 12. At the same time, the diversion groove 112 of the box 11 and the diversion groove 122 of the box cover 12
10 coupled together pass through two openings about the binding section 133 in the middle portion of the bag 13. The box 11 combined with the box cover 12 thus mounted within the bag 13 exhibits a stable straddling mounting mechanism. Finally, the upper end of the bag 13 is melt-sealed, leaving an extended section on which a hanging hole 134 is provided. A
15 bag for moisture removal 1 according to the present invention is thus assembled.

Another packing method of a bag for moisture removal 1 of the present invention is that the exsiccator 14 is firstly placed in the receptacle 110 within the box 11 and is then retained as the box cover 12
20 is covered thereon. The bag 13 is used to enclose the combined box 11 and box cover 12 to form a bag for moisture removal 1, which is then inserted into a vacuum bag 5, as shown in Fig.9. The vacuum bag 5 is then vacuumed so that the inner surface thereof sticks onto the outer surface of the bag 13 and that an adhesive paper sheet 131 sealing the
25 through holes 130 is unnecessary.

A bag for moisture removal 1 thus assembled is for hanging within a room or a cargo container, as shown in Fig.3 and 4. To activate the bag for moisture removal 1, the adhesive paper sheet 131 on the bag 13 is

removed in the first packing method, and the vacuum bag 5 is cut open in the second packing method. The surrounding moisture is absorbed through the through holes 130 on the bag 13 and the fine holes 120 on the box cover 12 by the exsiccator 14 in the box 11, and the water drops
5 are gravity pulled downward through the diversion groove 112 and diversion groove 122 and are collected in the liquid container 132 of the bag 13.

Referring to Fig.5 to 7, the second preferred embodiment of the present invention has a box 11', one lateral side of which is connected
10 with a box cover 12'. The box cover 12' is folded onto the box 11', and the box 11' is then enclosed in a bag 13. The interior portion of the box 11' is provided with a receptacle 110' for housing exsiccator 14', and the lateral side of the box 11' opposite to the one connected with the box cover 12' is provided with a roofed edge 111' for being attached to the box cover 12'.
15 The box 11' and the box cover 12' are respectively provided with at least one diversion groove 112' and diversion groove 122' at one end thereof. The box cover 12' is further provided with a large number of fine holes 120' on the surface thereof and with a plurality of inlaying granular objects 121' along an outer lateral side thereof for retaining the roofed edge 111'
20 of the box 11'. The bag 13, having the same structure as of the first preferred embodiment, includes an upper portion for housing the box 11' and a lower portion being a liquid container 132. The bag 13 is further provided with a hanging hole 134 close to the top end of the upper portion and a plurality of binding points 133 on the liquid container 132 for
25 preventing over-expansion of the liquid container 132 that would bulge to occupy cargo storage space. A bag for moisture removal 1 thus formed is for hanging in a room or in a storage cabinet, which can be sealed before use either with an adhesive paper sheet 131 or a vacuum bag 5.

Referring to Fig.8 and 9, the third preferred embodiment of the present invention comprises an above-mentioned bag for moisture removal 1, a carton outer cover 2 and a carton stand 3, in which the outer cover 2 is provided with an open bottom end and a connecting portion 20 for connecting the upper end of the bag for moisture removal 1. A window 21 is formed on one side of the outer cover 2, which corresponds to the fine holes 120 (120') of the box cover 12 (12'). Two lateral sides of the outer cover 2 are each provided with a fold 22 for collapsing the outer cover 2 when not in use so as to save storage space and facilitate shipment. The stand 3 is mounted within the lower portion of outer cover 2 for housing the liquid container 132 of the bag for moisture removal 1. Each of the lateral faces of the stand 3 is provided with a fold 30, and a waterproof bag 31 is attached around the interior wall of the stand 3. The stand 3 can be adhesively or rivet connected with the outer cover 2. To use the bag for moisture removal 1, the stand 3 is firstly unfolded to stand uprightly, and the outer cover 2 is accordingly expanded. To activate the standing bag for moisture removal 1, the adhesive paper sheet 131 on the bag 13 is removed, and the surrounding moisture is absorbed by the exsiccator 14 in the box 11, and the water drops thereby formed are gravity pulled downward and are collected in the liquid container 132 of the bag 13. The stand 3 supports the liquid container 132, which is double protected by the waterproof bag 31 to prevent leakage.

Referring to Fig.10 and 11, when the present invention as a bag for moisture removal 1 is being shipped, the bag for moisture removal 1, with its lower portion folded onto its upper portion, is packed in a vacuum bag 5 and is then placed in a packing box 4; the packing box 4 is provided with a liftable upper cover 40. To use the bag for moisture removal 1, the liftable upper cover 40 is opened, and the bag for moisture

removal 1 is hanged on a wall surface, leaving the liquid container 132 of the lower portion retained in the packing box 4. The packing box 4 therefore has both functions of packing and supporting.

Referring to Fig.13, the fourth preferred embodiment of the present invention has exsiccator 14 to be directly packed in a bag 13 that has the same structure as of the first the preferred embodiment. The upper portion of the bag 13 has one side provided with many through holes 130, sealed by an adhesive paper sheet 131 when not in use. The bag 13 may also be sealed in a vacuum bag 5 for storage. The lower portion of the bag 13 is the liquid container 132 on which a plurality of binding points 133 is provided. The upper end of the bag 13 is further provided with a hanging hole 134. This preferred embodiment is for providing a faster effect of moisture removal, the use of the bag for moisture removal 1 is the same as that of the other preferred embodiments.

According to the above descriptions, the present invention has the following advantages.

1. The bag for moisture removal takes a flat or bar-like shape and is for hanging in a room or in a storage cabinet to remove moisture, which occupies little space.

2. The box of the bag for moisture removal has one side being trapezoid-shaped, which is accommodated to grooves on the wiggled wall of a cargo container.

3. The bag for moisture removal, being used with a carton outer cover and a carton stand, can stand uprightly on the floor of a basement or a regular room.

4. The carton outer cover and carton stand of 3 are provided with folds for collapsing the body of the bag for moisture removal so as to facilitate the shipment of the bag for moisture removal.

5. The bag for moisture removal is folded and packed in a packing box for storage and shipment. In this configuration the packing box can not only pack but also retain the bag for moisture removal.

6. In another packing configuration exsiccator 14 is directly packed
5 in a bag for providing a faster effect of moisture removal, which particularly suits spaces of high moisture.

The present invention is thus described, and it will be obvious that the same may be varied in many ways. Such variations are not to be regarded as a departure from the spirit and scope of the present invention,
10 and all such modifications as would be obvious to one skilled in the art are intended to be included within the scope of the following claims.

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